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MEMORANDUM CH2MHILL

Response to USEPA Comments on the Draft Five-Year Review Report for Sites 1, 2, 3, 6, 20, and 23 at Naval Station Norfolk

TO: Steve Hirsh/USEPA

COPIES: Ms. Winoma Johnson/MIDLANT

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FROM: Holly Rosnick/CH2M HILL

DATE: September 30, 2008

Below is the response to the United States Environmental Protection Agency (USEPA) on the *Draft Five-Year Review for Sites 1, 2, 3, 6, 20, and 23: Naval Station Norfolk, Norfolk, Virginia.* The responses to the comments will be incorporated in the final report.

Comments

1. **Five-Year Review (FYR) Summary Form, Camp Allen Landfill (CALF), Issues and Recommendations; Section 4.6, pages 4-7 and 4-8.** There is no mention of vapor intrusion here as a potential issue to be evaluated, nor is it included in the Issues or Recommendations and Follow-up Actions tables in Section 4 pertain to CALF. It is unclear from the information presented whether the data from the January 1993 indoor samples is sufficient for the conclusion that there is no potential risk from VI. This data should be reviewed to ensure that it is consistent with current EPA protocols for indoor/outdoor air sampling.

   Furthermore, the rationale that decreasing groundwater concentrations would result in a decreasing amount of contributing vapors is questionable. Data exists that indicates that levels of contaminants in groundwater do not directly correlate to the levels of air contaminants in buildings located above or near plumes. Until levels in groundwater decrease below MCLs within 100' of each building, the potential for unacceptable levels of risk from VI should be considered. In addition, as time passes, building foundations tend to degrade and the potential for the development of additional preferential pathways into buildings increases.

   Based upon the figures provided in Section 4, it appears that there may be additional buildings, aside from those mentioned, within 100' of one or more of the plumes at CALF. Pending review of the historical air monitoring data, it is recommended that the potential for VI be evaluated for each building in questions and if necessary, additional indoor/outdoor air or sub-slab sampling be conducted definitively determine the presence of VI.

Response: As detailed in Section 4.6, page 4-8, the indoor air was evaluated as part of the human health risk assessment which included the collection of air samples (details provided in response to comment #3 below). The indoor air evaluation did not result in unacceptable risks for either the brig or elementary school. As indoor air samples have already been collected and an evaluation conducted, the Navy does not believe any additional activities are required for these buildings. The indoor air sampling was conducted as part of the remedial investigation and is summarized in that report (*Final Camp Allen Landfill RI Report, Norfolk Naval Base, Norfolk Virginia*, July 1994). The air monitoring results were evaluated as part of the risk assessment and is included in that report (*Revised Final Baseline Risk Assessment, Camp Allen landfill, Norfolk Naval Base, Norfolk Virginia*, February 1995).

The Navy acknowledges that indoor air samples were not collected from the Marine Barracks. The Five Year Review report included a qualitative evaluation of the groundwater concentrations in the vicinity of the Barracks to evaluate potential impacts on human health. Additionally, a direct push groundwater investigation was conducted in Area B adjacent to the Barracks to further delineate the VOC plume. As a result, the plume boundary was determined to be slightly smaller than that reflected in Figure 4-1 in the Draft Five Year Review Report, thus the VOC plume is estimated to be just over 100 feet from the Barracks and therefore, the Navy does not believe that vapor intrusion is a concern for the Barracks. However, the Navy acknowledges that additional assessment of the Marine Barracks will be required in accordance with the current Navy guidance before the next Five Year Review. If the land use changes prior to the completion of this VI assessment, we acknowledge that this assessment may not be required.

2. <u>FYR Summary Form, Section 5, Recommendations and Follow-up Actions, 1st bullet.</u> Please revise sentence to read, "The potential for vapor intrusion should be **evaluated as a screening step** based on the presence of volatile organic…."

Response: Navy recommends the sentence be revised to "The potential for vapor intrusion will be assessed based on the presence of volatile organic…".

3. <u>Section 4.2, page 4-2, 4th paragraph, last sentence.</u> Please indicate when the sampling was conducted and for what contaminant sampling and analysis was conducted.

Response: From January 12 through 14, 1993, air sampling was performed at and around Camp Allen Landfill (Site 1) to provide analytical support in the assessment of potential health risks from certain VOCs. Samples collected during the investigation followed the procedures specified in the USEPA Compendium Method TO-14 which is applicable for the determination of a wide variety of VOCs. This method was specifically established for the collection of whole air sampled in SUMMA electropolished, stainless steel canisters. This information is summarized in the *Final Camp Allen Landfill Remedial Investigation Report*, July 1994.

4. **Section 4.4, page 4-5, 1st paragraph, last sentence.** Please revise sentence to reference section 4.5.1.

Response: Change will be incorporated into text but will reference Section 4.5.2 as opposed to the 4.5.1 per the comment.

5. **Section 4.5.1, page 4-6, 1st paragraph.** The issue regarding stable or increasing levels of VOCs and the proposed resolution should be included in Sections 4.7 and 4.8.

Response: The language in the Five Year Review will be revised to summarize the declining concentration trends since the implementation of the pump and treat system. Currently the language is discussing a year-over-year comparison as opposed to an overall system trend. As a result of this text revision and the overall decreasing trend of the groundwater concentrations, the Navy does not believe this information is needed in Sections 4.7 and 4.8.

6. **Section 4, Figures 4-3 through 4-5.** Please revise figures to include the data referenced in the preceding text and suggested by the legend of each figure.

Response: The data will be added to the figures.

7. **Table 4-1.** In several instances throughout the document, the conversion to MCLs for cleanup goals is mentioned. While some of these changes have not yet been made official through appropriate documentation, it is recommended that each table detailing the current cleanup goals also include the pending revised cleanup goals.

Response: Change will be incorporated into text.

8. **Section 5.1, page 5-1.** Please revise the last 2 events in the site chronology so that they are in chronological order.

Response: Change will be incorporated into text.

9. **Section 6.4, 2nd paragraph, last sentence.** Please revise sentence to refer Section 6.6.

Response: Change will be incorporated into text but will reference Section 6.5.1, Site 3 Long-Term Monitoring Data Review as opposed to the Section 6.6.

10. **Section 6, Figures 2-3 through 2-5.** Please revise figures to include the data referenced in the preceding text and suggested by the legend of each figure.

Response: The data will be added to the figures.

11. **Section 8.4, page 8-4, 2nd paragraph, last sentence.** Please provide additional explanation regarding the "flexibilities," specifically what they are and how they are/can be used.

Response: The specific reference to the flexibilities will be removed from the document, however additional discussion will be added to Section 8.4 that provides details on the Team's path forward for Site 20. Additionally, the path forward that the Team discussed during the August 2008 Tier 1 Partnering Team meeting will be included in the report. This discussion will be "The NSN Partnering Team is developing the groundwater conceptual site model (CSM), evaluating the potential presence of a dense non-aqueous phase liquid (DNAPL), and evaluating the site impacts associated with historic filling activities. As a result of these Partnering Team activities, the path forward for the groundwater at Site 20 will be determined and included in the next Five Year Review.

12. **Section 8.6, page 8-6, Changes in Risk Assessment Methodologies, 2nd paragraph, 2nd sentence.** It should be noted that the combination of an extensive building survey to determine the chemicals currently used in building operations and a detailed analysis of indoor air samples can greatly assist in determining what indoor vapors, if any, are the direct result of vapor intrusion.

Response: The Navy has provided that some air monitoring data has been collected from manholes during the pilot study and additionally air monitoring is conducted weekly as part of the AS/SVE operations from 16 locations in the vicinity of system. Based on that data, the Navy believes vapor intrusion is not a concern. However, the Navy understands that there is limited air monitoring information available for Site 20 and acknowledges that additional indoor air assessment will be required prior to the next Five Year Review.

13. **Sections 8.7 and 8.8, 1st Issue.** It can be argued that given potential for vapor intrusion at the site and current lack of data, the Future Protectiveness of the remedy could be affected. It is recommended that the future protectiveness fields be changed from "N" to "Y."

Response: Based on the response to Comment 12 indicating the air monitoring information that is available, the Navy believes that the remedy is currently protective and anticipated to be protective in the future and therefore does not need to be included in Sections 8.7 or 8.8. However, the Navy does acknowledge that additional assessment of Site 20 will be required before the next Five Year review.

14. **Section 8.8, Recommendation and Follow-up Actions, 1st Issue, 1st sentence.** Please revise to read, "**An evaluation of** the potential for vapor intrusion…"

Response: The Navy recommends the sentence be revised to "An *assessment* of the potential for vapor intrusion...".

15. **Section 8.9.** This protectiveness statement does not acknowledge the potential affect of vapor intrusion on future protectiveness. Please revise the sentence accordingly.

Response: The Navy has provided that some air monitoring data has been collected from manholes during the pilot study and additionally air monitoring is conducted weekly as part of the AS/SVE operations from 16 locations in the vicinity of system. Based on that data, the Navy believes vapor intrusion is not a concern and therefore, the system is

protective. However, the Navy understands that there is limited air monitoring information available for Site 20 and acknowledges that additional indoor air assessment will be required prior to the next Five Year Review.

16. Section 10.3.1. Please specify the nature of the actual selected remedy.

Response: Comment will be incorporated into text.

EPA HQ COMMENTS:

1. Site 2 Figure 5-2 presents a list of total and dissolved metals in groundwater. Some of the metal concentrations showed an increase in June 2004 compared with the results in April 1997. However, there is no groundwater treatment system in place at Site 2 so it is not clear what the reason is for monitoring the groundwater contamination. It is noted that according to Figure 2-1 Site 2 is located near the installation boundary adjacent to the City of Norfolk, and in the State of Virginia all groundwater is considered usable for drinking purpose even though an aquifer may not be used. Further, one of the Remedial Action Objectives (page 5-2) stated is to "prevent degradation of groundwater quality by limiting downward percolation of precipitation into the water table aquifer beneath Site 2.

Response: The LTM program was implemented as a requirement in the ROD (October 2000) to evaluate the effectiveness of the remedial action. Sediment, surface water, and groundwater samples were collected annually for five years (2000 through 2004) to monitor the concentrations of the metals at the site and determine off-site migration. Statistical evaluation of analytical results indicated that concentrations of metals in groundwater showed a decreasing trend since the remedial action was implemented. Based on ROD stipulations, statistical analysis, and consensus of the Tier 1 Partnering Team, the LTM groundwater at Site 2 has been reduced to a frequency of once every five years (next event to occur in 2009).

2. The two issues identified in Section 8.7 beginning on page 8-6, namely that there is a need to evaluate the possible vapor intrusion into the building, and that the groundwater treatment system may have reached its limits of effectiveness after 11 years of operation (see Figure 8-2), need to be addressed with a possible plan of action since the milestone date for follow-up actions is dated September 2008. Otherwise the protectiveness statement on page 8-7 should be revised as "short-term protectiveness

Response: The Navy has provided that some air monitoring data has been collected from manholes during the pilot study and additionally air monitoring is conducted weekly as part of the AS/SVE operations from 16 locations in the vicinity of system. Based on that data, the Navy believes vapor intrusion is not a concern. However, the Navy understands that there is limited air monitoring information available for Site 20 and acknowledges that additional indoor air assessment will be required prior to the next Five Year Review.

Additionally, the language "...groundwater treatment system may have reached its limits of effectiveness after 11 years of operation" will be removed from the Final Five Year Review. This language will be replaced with "groundwater treatment system may require additional enhancement to expedite the reduction of VOC concentrations".

Additionally, the path forward that the Team discussed during the August 2008 Tier 1 Partnering Team meeting will be included in the report. This discussion will be "The NSN Partnering Team is developing the groundwater conceptual site model (CSM), evaluating the potential presence of a dense non-aqueous phase liquid (DNAPL), and evaluating the site impacts associated with historic filling activities. As a result of these Partnering Team activities, the path forward for the groundwater at Site 20 will be determined and included in the next Five Year Review. Currently, the system is considered to be protective and will continue to be protective in the future, however, the additional evaluation activities are to ensure the remedial system achieves its objective in a shorter timeframe.

BTAG COMMENTS:

1. In many instances the technical assessments provided in the document only specifically address human health risk assessment. Ecological Risk Assessment should also be addressed.

Response: Details on the ecological evaluations that have been completed as part of the RI process will be added to the report.

2. It is not clear if ecological evaluations or risk assessments were conducted for each of the sites addressed and whether or not the potential migration pathways and impacts of contaminated groundwater discharging to surface water were evaluated.

Response: Details on the ecological evaluations that have been completed as part of the RI process will be added to the report.

3. In addition to the potential risk posed by the groundwater contaminants themselves, the degradation products of many VOCs may mobilize inorganic compounds which may in turn elevate risk to unacceptable levels in the hyporheic and aquatic environment. The document and monitoring programs should address this issue. Furthermore, monitoring apparently has been limited to groundwater and surface water. The document should provide the rationale for not including sediment sampling as the document notes that sediments were contaminated.

Response: The Navy acknowledges that degradation may occur and cause the mobilization of inorganics. However, these metals were not detected at concentrations associated with a site release at levels posing an unacceptable risk and not selected as COCs for the site. As the releases from the site occurred prior to the early 1970s, the mobilization of inorganics would have occurred prior to the investigation activities and thus been evaluated as part of the risk evaluation. Additionally, a review of the inorganic concentrations between the remedial investigation results and the 2007 extraction well results indicate similar or lower concentrations of inorganic compounds. Therefore, it is

unlikely that additional mobilization from contaminant degradation has occurred since the selected remedy was implemented.

Because the constituents of concern in groundwater are VOCs, sampling groundwater and surface water should be sufficient as VOCs are unlikely to accumulate in sediments based upon their physical properties (e.g., low log Kow values). The Five Year Review report will be revised to include additional discussion associated with the preparation of the Ecological Risk assessment conducted in November of 2006 which resulted in a sediment removal action that was completed in 2008 which removed the contaminated sediment. As detailed in the EE/CA, the removal action included the removal of 2 feet of sediment and backfilling 1 foot of clean fill (except in the concrete lined portion which removed all sediment). Therefore, monitoring was not required per the removal action.

4. Section 4.4 refers to Sections 4.4.2 and 4.4.3 which are not present in the report.

Response: Text will be revised to reference Sections 4.5.1 and 4.5.2 for Site 1 Site Inspections.

5. The text indicates that Figures 4.3 and 4.4 present the contaminant concentrations detected in groundwater at Site 1, however this information is not provided.

Response: The data will be added to the figures.

6. Table 4.1 indicates that the shallow aquifer clean-up goals are going to be revised pending approval of an ESD. This should be noted in Sections 4.7 and 4.8. It should be noted that dependent on the migration pathway, the current clean-up goals may not be protective of ecological receptors if contaminants are present at these concentrations in receiving surface waters.

Response: While the recommended clean-up goals (based upon MCLs) are not always lower than both the current freshwater and marine BTAG surface water screening values (the waters are generally brackish in this system), this comparison assumes groundwater discharge to surface water with no dilution, attenuation, etc. Additionally, all of the VOCs that have been detected in the surface water were below the freshwater and marine BTAG screening values.